32. *PTERIS HETEROMORPHA* FEE PTERIDACEAE: A NEW DISTRIBUTIONAL RECORD FOR ANDHRA PRADESH

During a recent pteridophyte exploration of Andhra Pradesh, some rare and interesting specimens of *Pteris* were collected. After thorough checking of literature, the present report describes a rare and interesting taxon, which is identified as *Pteris heteromorpha* Fee. This species was earlier described by Nair and Ghosh (1978) and believed to be rare in Orissa. It was recently collected by us and also G. Madulla from the Visakhapatnam district of Andhra Pradesh. This species has not been recorded earlier from Andhra Pradesh; hence, it is reported as a new record. A short description of the species is given with an illustration, correct nomenclature, brief diagnostic characters, collection site, Field Numbers, notes on ecology and distribution of the taxa have been recorded.

Pteris heteromorpha Fee. Gen. fil.127, 1852; Hook sp. fil. 2; 166; t.1278, 1858, Hook. et Baker, syn. fil. 156.1867; Beddome, Ferns Brit. India 1865; *P. propinqua*, J.m. Jour. Bot. 3: 405 (1841); *P. cretica* var. *heteromorpha* (Fee). Bedd. Handb. Ferns. Brit. India. 106. 1883, with supplement 106, 1892.

Rhizome short, erect covered with brownish linear scales up to 1 cm long, hairs marginal, root wiry. Stipes 12-30 cm long, base with very few scattered scales similar to those on the rhizome, naked above, erect. Fronds 25-40 cm long, 8-15 cm broad, ovate, lanceolate, subcoriaceous. Pinnae with the lower portion sinuate and provided with a few short linear lobes; lateral pinnae erectopatent; the higher one linear lanceolate 7-10 cm long up to 1.5 cm broad, simple with 1-4 lobes near the base; lower pinnae 3-6 cm apart, 10-20 cm long, cut down nearly to the costa with 2-6 linear oblong, very long terminal segments, the lateral lobes varying from very short to 2 cm long up to 1 cm. margin sub crenate. Veins prominent, reaching up to the margin, usually with one fork. Sori continuous, but not reaching to the apex. Indusium narrow membranous (Fig. 1).

Specimen examined: India, Andhra Pradesh, Visakhapatnam, Coll. G. Madulla February 8, 2002, Manickam (XCH21672).

Field Notes: It occurs rarely along exposed dry deciduous forest at 450 m (G. Madulla). Pinnae with the lower portion sinuate and provided with a few short linear lobes, lateral pinnae erectopatent.

Distribution: *Pteris heteromorpha* was first discovered from Luzon (Philippines) by Cumming, subsequently it was reported from Java, Myanmar and Celebes (Alderberlet van Rosenberg 1908; Christensen 1906)

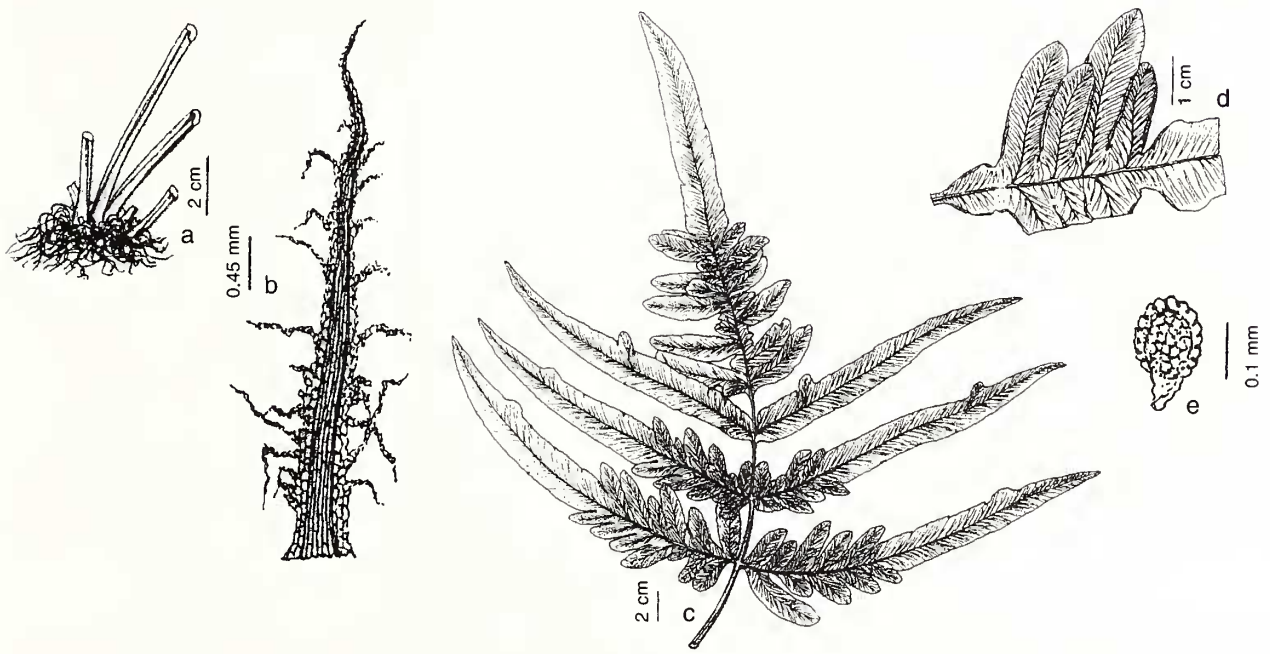

Fig. 1: *Pteris heteromorpha* Fee. a. Rhizome; b. Rhizome scale; c. Lamina; d. Pinna enlarged showing venation and sori; e. Sporangium

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REFERENCES

ALDERBERLET VAN ROSENBERG, C.R.W.K. (1908): Handbook to the Determination of the Ferns of the Malayan Island, Landsdrukkerij, Batarria.

CHRISTENSEN, C. (1906): *Index Filcum*. Hafniae, Hagerup, Koenigstein.

NAIR, N.C. & R.K. GHOSH (1978): A new record for India. *Indian forester 104(5)*: 373-376.

33. *GRACILARIOPSIS LEMANEIFORMIS* (BORY) DAWSON – A RED ALGA REPORTED FROM CERTAIN BACKWATERS OF KERALA

A long cylindrical thalloid multifariously branched red alga was reported from Dhalawapuram (Ashtamudi lake), Kadalundi (Kadalundinagaram) and Mopla Bay (Kannur) and was later identified as *Gracilariopsis lemaneiformis* (Fig. 1). The salinity in all these regions ranged from 14 to 20 ppt during the non-monsoon period; during the SW monsoon, this species could not sustain drop in salinity below 8.0 ppt. The species grows attached loosely to the sediment along with subdominant forms of green algae such as *Enteromorpha linza* and *Chaetomorpha linum*. The density ranged from 300-900 gm/sq. m in Mopla bay and 150-600 gm/sq. m in Dhalawapuram during the peak growth season of October to January. The standing crop in both the estuarine areas of about 20 hectares was estimated to be 12-15 tonnes (wet wt.)/yr.

In India, *Gracilariopsis lemaneiformis* was reported from Pamban, Mandapam and Visakhapatnam by Umamaheswara Rao (1972). Preliminary survey conducted in certain areas of Ashtamudi lake revealed the presence of agarophytes, alginophytes and carrageenophytes (Nair *et al.* 1982); no attempt was made to quantify them and occurrence of this species was not reported. Resource assessment survey conducted by Chennubhotla *et al.* (1988) along the Kerala coast also did not record the occurrence of this alga; the present report is the first from the Kerala coast.

The polysaccharide content in this species ranged from 18 to 26% dry wt. The moisture content in the thallus was 87%. Since this alga has affinity towards sandy loam bottom, bottom set nets/rafts can be used for cultivation trials as polyculture with mussels or oysters.

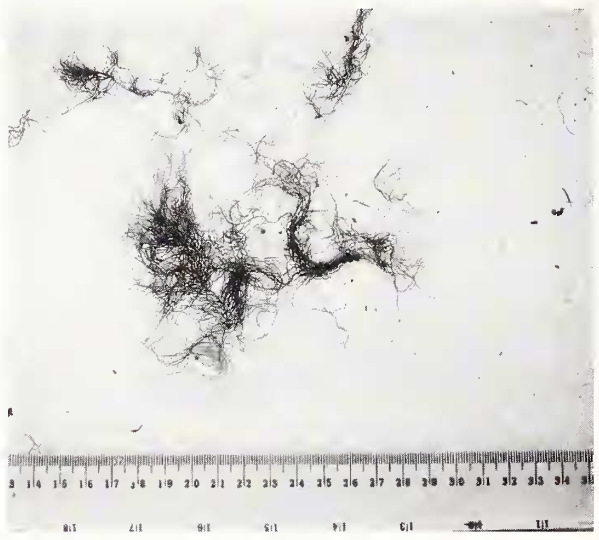

Fig. 1: *Gracilariopsis lemaneiformis* collected from Dhalawapuram (Ashtamudi lake)

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REFERENCES

CHENNUBHOTLA, V.S.K., B.S. RAMACHANDRUDU, P. KALADHARAN & S.K. DHARMARAJA (1988): Seaweed resources of Kerala coast. *In*: Aquatic Botany. Bulletin of the Dept. Aquat. Biol & Fisheries, University of Kerala Vol. VII(1991): 69-74.

NAIR, B.N., V. SHOBA & M. ARUNACHALAM (1982): Algae from Southern Kerala coast. *Indian J. mar. Sci. 11(3)*: 266-269.

UMAMAHESWARA RAO, M. (1972): On the Gracilariaceae of the seas around India. *J. mar boil. Assn India. 14(2)*: 671-696.